

CHETRAFILOV, D.; OBREYKOV, L.; TANKOV, Iv.; ANDONOV, G.

A case of a large solitary calcified renal cyst. Khirurgia  
(Sofia) 18 no.5:599-601 '65.

1. Okryzhna bolnitsa, Pazardzhik (gl. lekar St. Stanchev).

ANDOR, Jozsef; DEMETER, Sandor

Construction of concrete strip roads. Erdo 11 no.10:465-468  
0 '62.

1. Delsomogyi Allami Erdogazdasag fomernoke (for Andor).
2. Melyepitesi eloado, Delzalai Allami Erdogazdasag, Nagykanizsa  
(for Demeter).

ANDO, M.

Data on the temperature of sandy soil. p. 230  
IDOJARAS, Budapest. Vol. 59, no. 4, July/Aug. 1955.

SOURCE: East European Accessions List (EEAL), LC, Vol. 5, No. 2, February 1956

SZABO, Laszlo, dr., foiskolai tanar; LANG, Sandor, egyetemi docens,  
a foldrajztudomanyok kandidatusa (Szeged); ANDO, Mihaly, dr.

Report on the work of the Szeged Section. Foldr kozl 10  
no.3:303-304 '62.

1. Magyar Foldrajzi Tarsasag Szegedi Osztalya elnoke (for Lang).
2. Magyar Foldrajzi Tarsasag Szegedi Osztalya tarselnok  
(for Szabo).
3. Magyar Foldrajzi Tarsasag Szegedi Osztalya  
titkara (for Ando).

ANDO, Mihaly, dr.

Microclimatical temperature variations of a sand surface under various weather conditions. Foldrajzi ert 10 no.1:1-22 '61.

KHAYASI, K. [Hayashi, K.]; ANDO, T., prof.; KIMURA, K.; ZLOMANOV, V.A.,  
[translator]; ZORIN, A.Ye. [translator]; LEVIN, L.Z.  
[translator]; PASHKOVSKIY, A.A. [translator]; SMIRNOV, P.I.,  
red.; BUKOVSKAYA, N.A., tekhn. red.

[Ordnance rockets and Japan; military bases are a war threat]  
Raketnoe oruzhie i Iaponiia; voennye bazy - ugroza miru. Vstup.  
stat'ia i kommentarii B.G.Sapozhnikova. Moskva, Voen. izd-vo  
M-va oborony SSSR, 1961. 246 p. Abridged translation from the Japanese.  
(MIRA 15:2)

1. Tokiyskiy universitet (for Ando).  
(Japan--Rockets (Ordnance))

ANDOLJSEK, M.

ANDOLJSEK, M. How to reduce construction costs of electric-power plants. p. 878,

Vol. 10, no. 6, 1955  
TEHNIKA  
Beograd, Yugoslavia

So; Eastern European Accession Vol. 5 No. 1 April 1956

ANDONE, G.; PASHKOVSKIY, S.; Prinimali uchastiye: BARBOS, V., nablyudatel';  
MIKHAY, M., nablyudatel'; POPA, Sh. [Popa, S.], nablyudatel'

Wintering of water birds and some other birds in the Danube Delta  
in 1958-1959. Migr. zhiv. no.3:118-125 '62. (MIRA 16:2)

1. Lesnoy nauchno-issledovatel'skiy institut Rumynskoy Narodnoy  
Respubliki.

(Danube Delta--Birds in winter)



ANDONE, Ion

Increase of salaries for oil and gas workers. Petrol si gaze 14  
no.2:101-104 F '63.

ANDONE, Traian

Real support for studying and extending advanced methods and initiatives of work in agriculture. Munca sindic 6 no.10:23-26 0 '62.

1. Activist, Sectia Economica, Consiliul Central si Sindicatelor.

SIMIONESCU, T.; ANDONIAN, M.

Determinant factors in the synthesis of p, p'-dioxydiphenylpropane.  
Rev chimie Min petr 13 no.6:340-344 Je '62.

AND: 14, 11.

Operation and mechanical and chemical treatment of pressure wells. p. 510.  
PETROL SI IAZE, Bucuresti, Vol. 5, no. 12, Dec. 1954.

50: Monthly List of East European Accidents, (MML), 12, Vol. 4, no. 12, Oct. 1955,  
Uncl.

M. ANDONIE

RUMANIA/Chemical Technology. Chemical Products and Their  
Application. Part 2. - Ceramics. Glass. Binders.  
Concretes. - Binders, Concretes and Other Silicate Building Materials.

Abs Jour: Referat. Zhurnal Khimiya, No 21, 1958, 71595.

Author : M. Andonie, Helmut Voinea.

Inst :

Title :

To the Question of Preparing Acid Resisting  
Concretes.

Orig Pub: Ind. constructiilor si mater. constr., 1957, No 11,  
644-654.

Abstract: A review of work carried out by the building trust  
in order to inquire into the possibility of prepar-  
ing acid resisting concretes by the method of treat-  
ing with  $\text{SiF}_4$  in autoclaves. The preliminary labora-

Card : 1/3

ANDONOV, B.: ARABADZHIEV, S.

Dimitur Blagoev and public health. Suvrem. med., Sofia  
7 no.9:99-102 1956.

(PUBLIC HEALTH  
contribution of Dimitur Blagoev in Bulgaria)  
(BIOGRAPHIES  
Blagoev, Dimitur)

ANDONOV, B.

The public health policy of the Bulgarian Social-Democratic  
Labor Party in local elective institutions from 1910-1915.  
Nauch. tr. vissh. med. inst. Sofia 41 no.6:69-82 '62.

1. Predstavena ot dots. Gr. Vekilov.  
(PUBLIC HEALTH ADMINISTRATION)

ANDONOV, G.

"On the condition of industrial safety and illnesses in mining and metallurgic enterprises."

p.9 (Minno Delo, Vol. 12, no. 1, Jan./Feb. 1957, Sofia, Bulgaria)

Monthly Index of East European Accessions (EEAI) LC, Vol. 7, No. 8, August 1958



KURSHEV, Iv.; IVANOV, D.G.; ROKOV, (h.I.; ANDONOV, G.V.

Preparing ammonium chloride by heating a mixture of hard ammonium sulfate and hard potassium chloride. Khim i industriia 36 no.7: 247-250 '64.

1. Chemical and Technological Institute, Sofia (for Kurshev and Ivanov).

ANDONOV, K.

"The Vasil Levski Brigade Made up of Efficient Young Men of the Anthracite Mine at the State Mining Enterprises", F. 28, (MINNO DELO, Vol. 9, No. 2, Feb. 1954, Sofiya, Bulgaria)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No.1, Jan. 1955, Uncl.

ANDONOV, K.

66L.90 n Advancement in Driving of Preparatory Galleries in One Month.  
Minno Delo (Mining), #5:92: Sept-Oct 55

ANDONOV, K.

American Monopolies Disorganize the Economy of Canada. Minno Delo  
(Mining), #5:103: Sept-Oct 55

ANDONOV, K.

Brief Information, Minno Delo (Mining), #5:105: Sent-Oct 55

ANDONOV, K.

New Books: "Ventilation of Mines" and "Water Drainage of Mines"  
Minno Delo (Mining), #5:10<sup>8</sup>: Sept-Oct 55

ANDONOV, K.

Articles on the Mining Industry, Published in the Soviet Press.  
Minno Delo (Mining), #5:109: Sept-Oct 55

ANDONOV, K.

Mining Technics Exhibited at the Plovdiv Fair. Minno Delo (Mining),  
#5:110: Sept-Oct 55



GEORGIEV, Telfon; ANDONOV, Mihail

Results from the studies on some foreign water double hybrids in  
the Brushlyan irrigation system. *Trakarski zbornik* 2 no. 01223-1230  
'63.

20.000.07, Tbilisi, agr.; ANDRIV, Kikidze, agr.

Intensity of seed sowing in the Brachyan integration system.  
Phidrotekh 3 melior 9 no. 58175-176, 158 '61.

ANDONOV, P.; IVANOV, N.; RANGELOVA, St.; NIKOLOVA, Z.; RUSAKYEV, M.;  
GROMKOVA, R.

The use of serological investigations in studying the epidemiology of  
some virus infections in Bulgaria. J. hyg. epidem., Praha 5 no.2:  
146-152 '61.

1. Scientific Research Institute of Epidemiology and Microbiology, Sofia.

(VIRUS DISEASES immunology)

ANDONOV, P.; TEOKHAROVA, M.; BRADVAROVA, I.; KARACHOLEV, I.; SHUMKOV, G.;  
STOYANOV, N.

Study of the etiology of infectious hepatitis. Vop.med.virus.  
no.9:16-23 '64. (MIRA 18:4)

UZUNOV, G.; SHUBLADZE, A.K.; BOZHINOV, S.; GAIDAMOVICH, S. I.; ANDONOV, P.;  
GEORGIEV, I.; OBUKHOVA, V.R.

Appropos of the etiology of subacute progressive hyparkinetin  
encephalitis in Bulgaria. Izv. microbiol. inst. 196732-423 '69

1. Grupa po neurologia i psikhiaatria pri Bugarската akademija  
na naukite (rukovoditel: G.Uzunov); Katedra po neurologia pri  
Visshia meditsinski institut, Sofia (rukovoditel: S.Bozhinov);  
Laboratoriia za sravnitelna virusologia pri Virusologicheskii  
institut "D.I.Ivanovskii", Moskva (rukovoditel: A.K.Shubladze)  
i Laboratoriia za virusni encefaliti pri NIEM, Sofia (ruk-  
voditel P.Andonov).

\*

ANDONOV, P.

"Urgent Problems Before the Sanitary and Antiepidemic Service. p. 3" (ZDRAVNO DELO)  
Vol. 6, No. 3, June 1952, Sofiya, Bulgaria

SO: Monthly List of East European Accessions L. C., Vol. 2, No. 11, Nov. 1953, Uncl.

ANDONOV, P.

"Joint Meeting of Clinicians and Epidemiologists." p. 2,  
(ZDRAVEN FRONT, No. 50, Dec. 1954, Sofiya, Bulgaria)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4  
No. 5, May 1955, Uncl.

RUSAKIYEV, M. [Rusakiev, M.]; KHRISTOVA, T.; ANDONOV, P.; PRODRUMOV, A.;  
PETKOV, I.; GRYNCHAROV, K. [Gruncharov, K.]; PACHEV, S.

Studies of the serum of some migrant birds in the presence of  
antibodies neutralizing the West Nile virus. Trudy epidemiol  
mikrobiol 8:139-141 '61 [publ. '62].



ANDONOV, P.

Current problems in virology. Suvr. med. 14 no.10:44-58 '63.

X

UZUNOV, G.; SHUBLADZE, A.K.; BOZHINOV, S.; GAYDAMOVICH, S.Ya.;  
ANDONOV, P.; GEORGIYEV, I.; OBUKHOVA, V.R.

Etiology of progressive hyperkinetic encephalitis in Bulgaria.  
Zhur. nevr. i psikh. 64 no.3:346-350 '64. (MIRA 17:5)

1. Nevrologicheskaya i psikhiatricheskaya klinika Vysshego  
meditsinskogo instituta (Sofiya), Laboratoriya sravnitel'noy  
virusologii Instituta virusologii im. D.I. Ivanovskogo AN  
SSSR (Moskva) i Laboratoriya virusnykh entsefalitov Nauchno-  
issledovatel'skogo instituta po epidemiologii i mikrobiologii  
(Sofiya).

RUMANIA

576.312.38:576.8.093.35

ANDONOV, P. and DUNDAROV, S., of the Institute of Epidemiology and Microbiology (Institutul de Epidemiologie si Microbiologie), Sofia.

"Methods for the Preparation of Clones of Cellular Lines on Primary Cultures of Human Embryonic Fibroblasts."

Bucharest, Studii si Cercetari de Inframiorobiologie, Vol 17, No 4, 66, pp 269-273.

Abstract: The authors describe a technique for preparing clones of human and animal cellular lines by growing on a substrate consisting of a primary culture of human embryonic fibroblasts. Since living cells are used as substrate, favorable conditions are obtained for the development of clones over a relatively long period. The method described is simple and can be used in any laboratory.

Includes 2 figures, 2 tables and 2 references, of which one Russian and one American. -- Manuscript submitted 20 October 1965.

1/1

USSR/Virology. Viruses of Transmissible Infections.

Abs Jour: Ref Zhur-Biol., No 14, 1958, 62140.

Author : Andonov, P.S

Inst :

Title : Persistence of Tick-Borne Encephalitis Virus Strains  
to Certain Physical and Chemical Factors.

Orig Pub: Vopr. virusologii, 1957, No 4, 228-234.

Abstract: 3 strains were investigated: "Yas-8", "1kh-10" and "Im". Heating of 10% brain suspensions of mice infected with these strains at 60-70° for 30-60 min. and at 100° 1-2 min did not produce their complete inactivation; 30-minute UV-exposure completely inactivated the suspension. With the action of alcohol and ether the strains maintained their activity after 2-4 days. 5% carbolic

Card : 1/2

USSR/Virology. Viruses of Transmissible Infections.

Abs Jour: Ref Zhur-Biol., No 14, 1958, 62140.

acid, 2- and 6% formalin, 1- and 3% chloramine, 0.02% potassium bichromate did not cause a loss of the viruses in a 5-10 minute exposure. 5% Lysol and 2% sodium hydroxide did not inactivate them even after 24 hours. With room temperature the viruses remained viable for 50 days, with 4° - 5-12 mos., with 20° - upwards of 1 year, in a dry condition - more than 7 years. -- G.D. Zasulchina.

Card : 2/2

SHUBLADZE, A.K., ANDONOV, P.S.

Studies on the adaptation of IAs-8- strain of tick-borne encephalitis  
virus to unfavorable conditions: Vop.virus 3 no.4:229 J1-Ag '58  
(MIRA 11:9)

1. Institut virusologii imeni D.I. Ivanovskogo AMN SSSR, Moskva.  
(ENCEPHALITIS, EPIDEMIC, virus  
Russian tick-borne, adaptation of Ias-8 strain  
to unfavorable cond. (Rus))

ANDONOV, P.S.

Virulence of the tick-borne encephalitis virus in chicks [with summary in English]. Vop.virus. 3 no.5:276-279 S-O '58 (MIRA 11:10)

1. Institut virusologii imeni D.I. Ivanovskogo AMN SSSR, Moskva.  
(ENCEPHALITIS, EPIDEMIC, experimental,  
tick-borne, in chicks (Rus))

ANDONOV, P.S.; SHUBIADZE, A.K.

Growth of strains of viruses of tick-borne encephalitis in chick embryo and HeLa cell tissue cultures. Vop. virus 4 no.1:94-100 Ja-F '59.

(MIRA 12:4)

1. Institut virusologii imeni D.I. Ivanovskogo AMN SSSR, Moskva.

(ENCEPHALITIS, EPIDEMIC, viruses,

culture in chick embryo & HeLa cell tissue culture (Rus))

(TISSUE CULTURE,

chick embryo & HeLa cell tissue culture for encephalitis virus (Rus))

USUNOFF, G., SHOUBLADZE, A.K., BOJINOV, S., GAYDAMOVITCH, S. YA.,  
ANDONOV, P. S., GEORGIEV, Iv. et OBOUHOVA, N.P. (Moscou, USSR)

"Recherches serologiques sur l'etiologie de l'encephalite  
hypercinetique progressive subaigue en Bulgarie"

Report submitted to the 7th Intl. Congress of Neurology,  
Rome, Italy, 10-15 Sep 61



ANDONOV, P.<sup>S</sup>; RUSAKIEV, M.; PRODRUMOV, A.

^  
A study of the etiology of seasonal viral encephalitis in Pomorye.  
Suvrem med., Sofia no.1:13-21 '61.

1. Nauchno-izsledovatel'ski institut po epidemologii i mikrobiologii.  
(Direktor: Vl. Kalaidzhiev) i Gradska bolnitsa, gr. Pomorie (Glaven  
lekar V. Nakov.)

(ENCEPHALITIS EPIDEMIC virol)

ANDONOV, P.; RUSAKIYEV, M. [Rusakiev, M.]

Nature and origin of the Bulgarian hemorrhagic fever. Trudy  
epidemiol mikrobiol 8:135-137 '61 [publ. '62].

KARACHOLEV, I.; ANDONOV, P.; VELICHKOV, V.

A study of the epidemiological features of diseases caused  
by 2-wave meningoencephalitis. Izv. mikrobiol. inst. 14:  
39-44 '62.

(ENCEPHALITIS, EPIDEMIC)

BULGARIA / Soil Science. Soil Genesis and Geography.

J

Abs Jour: Ref Zhur-Biol., No 2, 1959, 6043.

Author : Andonov, T.

Inst : Not given.

Title : Mapping the Soil in Bulgaria.

Orig Pub: Priroda (Bulg.), 1957, 6, No 4, 62-65.

Abstract: No abstract.

Card 1/1

APPROVED FOR RELEASE: 03/20/2001

CIA-RDP86-00513R000101320012-1"

ANDONOV, T.  
SURNAME (in caps); Given Names

Country: Bulgaria

Academic Degrees: not indicated

Affiliation: not indicated

Source: Sofia, Khizhena, No 2, Jan/Feb 61, pp 59-63

Data: "The General Health Condition of Bulgarian Workers in the  
Period of Capitalistic Boom (1903-1914)."

STATE COL 72, 5-1

11 AND 2ND OR (1)

PROCESSES AND PROPERTIES NOTES

21

New method of quenching coke with a water spray. S.  
M. Ankonov and M. F. Tsygmonov. *Coke and Chem.*  
1957, No. 1, 17-19 (USSR); *Chemie & Industrie*  
46, 142. The method consists essentially in discharging  
the incandescent coke into a special chamber and subject-  
ing it for 1-2 min. to a mist produced by atomizing water  
through special nozzles under a pressure of 6-8 atm. The  
thickness of the coke layer in the chamber should be 0.2  
0.3 m. A. Papineau-Couture

AND SEE METALLURGICAL LITERATURE CLASSIFICATION

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ANDON'YEV, S.M., laureat Stalinskoy premii, kandidat tekhnicheskikh nauk;  
LEONIDOV, N.K., redaktor; SHCHEDRIN, V.M., redaktor; MIKHAYLOVA,  
V.V., tekhnicheskii redaktor

[Water cooling of blast furnaces] Voprosy vodianogo okhlazhdeniia  
domennykh pechei. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po  
cherno i tsvetnoi metallurgii, 1952. 60 p. [Microfilm]  
(Blast furnaces) (Cooling) (MLRA 7:10)

~~ANDON YEV, S. M.~~

ANDON YEV, S. M.

8  
/ Cooling by Evaporation of Heating Furnaces used at K...  
Miss N. A. ... B. I. ...

OFF

ANDON'YEV, S.M., kandidat tekhnicheskikh nauk; FILIP'YEV, O.V., inzhener;  
~~POPOVA, Ye.V.~~

A new method for estimating the mixture of two flows in furnace  
heat engineering. Stal' 15 no.1:74-76 Ja '55. (MLRA 8:5)

1. Giprostal'.  
(Heat engineering) (Metallurgical furnaces)



Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 6, p 42 (USSR) SOV/137-57-6-9606 D

AUTHOR: Andon'yev, S.M.

TITLE: Evaporative Cooling of Metallurgical Furnaces at Ferrous Metallurgy Plants. Major Considerations (Isparitel'noye okhlazhdeniye metallurgicheskikh pechey zavodov chernoy metallurgii. Osnovnyye polozeniya) 1956

ABSTRACT: Author's dissertation for the degree of Doctor of Technical Sciences, presented to the In-t metallurgii. AN SSSR. Gos. Soyuz, in-t po proyektir. metallurg. z-dov (Institute of Metallurgy. Academy of Sciences, USSR. State Union Institute for Planning Metallurgical Factories), Moscow-Khar'kov, 1956. Comparative data on the engineering economics of water and evaporative cooling (EC) of metallurgical furnaces (F) are presented. EC has a favorable effect on the life of the parts being cooled, and the heat is used to advantage. Expressions are derived descriptive of EC: Stability of cooling ( $^{\circ}\text{C}$ ); critical water flow rate (m/sec); water requirement ( $\text{m}^3/\text{hr}$ ). EC requires chemically purified water. The vapor pressure in the system depends upon the possibilities for utilization of the steam. 40 atmospheres absolute pressure is best; however, existing systems maintain 4 atmospheres absolute pressure, and 10

Card 1/3

SOV/137-57-6-9606 D

## Evaporative Cooling of Metallurgical Furnaces (cont.)

atmospheres . . . pressure will be achieved in practical operation in the near-est future. EC of blast furnaces is examined, and a new cell-type design of coolers is suggested. An equation is presented that determines the heat loss by blast F into the cooling water. Analysis of the cooling elements of open-hearth F shows that cooling is needed only for the gas tanks, tuyères, front-wall skewback channels, and the frames of the charging doors. Experimental data on heat loss by the various cooled elements ( $\text{kcal/m}^2\cdot\text{hr}$ ) and equations for average heat loss by the cooled water for gas and heavy oil F are presented. A classification of EC systems with natural and forced circulation is presented. The use of steam for power is desirable at large plants only. In heating F, cooling is required for floor and lateral pipes, crown beams, and frames. Data on heat loss by continuous furnaces are available. Two heating furnaces using EC are operating at the Gor'kiy Auto Plant. Experimental data and an equation for calculating heat loss by the cooled elements of electrical F are adduced. Analysis of EC for blast, open-hearth, heating, and ferro-alloy F, and indices of the engineering economics of their operation are presented. The conversion of 100 open-hearth F to EC in 1955 saved 40,000,000 rubles. The life of the cooled elements increased 3 to 10 times.

G.G.

Card 2/3

SOV/137-57-6-9606 D

Evaporative Cooling of Metallurgical Furnaces (cont.)

ASSOCIATION: In-t metallurgii. AN SSSR. Gos. Soyuz. in-t po proyektir. metallurg. z-dov (Institute of Metallurgy. Academy of Sciences, USSR. State Union Institute for Planning Metallurgical Factories), Moscow-Khar'kov

Card 3/3

ANDON'YEV, S.M., kandidat tekhnicheskikh nauk.

~~XXXXXXXXXXXXXXXXXXXX~~  
On the article "Hot cooling of open hearth furnaces" by A.I.  
Turin and others. Stal' 16 no.1:66-67 '56. (MLRA 9:5)

1. Giprostal'.  
(Open hearth furnaces)

ANDON'YEV, S. M.

... of open-heart ...  
... S. M. Andon'ev ...  
... USSR ...  
... adjustment and control of the ...  
... M. Andon'ev ...

ANDON'YEV, Sergey Mikhaylovich, kandidat tekhnicheskikh nauk; RAYKOVSKIY, Yuriy Borisovich, inzhener; FILIP'YEV, Oleg Vladimirovich, inzhener; SHINDAREVA, Klara Yakovlevna, inzhener; KOROTITSKIY, D.N., otvetstvennyy redaktor; LIBERMAN, S.S., redaktor izdatel'stva; SINYAVSKAYA, Ye.K., redaktor izdatel'stva; ANDRUYEV, S.P., tekhnicheskii redaktor

[Evaporative cooling of open-hearth furnaces; fundamentals of cooling and principles of design] Isparitel'noe okhlazhdenie martenovskikh pechei; osnovnye polozheniia sistemy okhlazhdeniia i printsipy ee proektirovaniia. Pod obshchei red. S.M.Andon'eva. Khar'kov, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 356 p. (MLNA 10:6)  
(Open-hearth process) (Evaporating appliances)

ANDON'YEV. S.M.

137-58-5-9095

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5 p 50 (USSR)

AUTHOR: Andon'yev, S.M.

TITLE: Evaporation Cooling of Open-hearth Furnaces (Isparitel'noye okhlazhdeniye martenovskikh pechey)

PERIODICAL: Tr. Nauchno-tekhn. soveshchaniya po ispol'zovaniyu vtorichnykh energ. resursov. Moscow-Leningrad, Gosenergoizdat. 1957, pp 69-88

ABSTRACT: The following elements of evaporation-cooling (EC) systems are described: caissons for gas lines, tuyeres for injection of fuel oil, pivot girders, frames and crossbeams of charging doors, separator tanks, connecting lines, and regulating and metering apparatus and automation equipment. The following peculiarities of EC systems are examined: engineering and design factors, peculiarities of the circulation in an EC system, utilization of steam from EC systems, and cost-and-production criteria. Engineering criteria for the operation of EC systems are given: maximum thermal stresses on the surface of components being cooled; heat lost by individual components to the cooling water; total discharge of steam and the consumption of

Card 1/2

137-58-5-9095

Evaporation Cooling of Open-hearth Furnaces

chemically purified water; specific generation and consumption of steam; length of service of components being cooled; the efficiency of the open-hearth furnace; consumption of metal and pipe lines. See also RzhMet. 1957, Nr 9, abstract 16501.

Ye.N.

1. Open hearth furnaces--Cooling
2. Evaporation--Applications

Card 2/2



HANDON 124, 2007

AUTHORS: Andon'ev, S.M. (Candidate of technical sciences), Filip'ev, O.V., Volkov, V.F. and Sirenko, B.M. (Engineers). 130-3-20/22

TITLE: New Design of Air-Cooled Charging Door (Novaya konstruktsiya zaslonki, okhlazhdayemoy vozdukhom)...

PERIODICAL: "Metallurg" (Metallurgist), 1957, No.3, p.40. (U.S.S.R.)

ABSTRACT: Air-cooled charging doors for open hearths are being tested at the Stalinsk Metallurgical Works. These consist of a metal screening part and a lined plate. The plate is a steel box with internal reinforcement; the triple screen is made of sheet iron. In the event of failure the lined plate can easily be detached from the screen and replaced. The whole lined part is regularly replaced every month. Of two materials tested for the refractory lining of the plate the following was selected: 70 wt % chromite ore (grain size less than 7 mm), 30% highly calcined magnesite (grain size less than 0.088 mm) and 10% of a 10% sulphuric acid solution. The external temperature of the screen was found to vary from 500° at the start to about 800° at the end of the service life of lining; the corresponding heat losses were 600 and 15 000 cal/hr. An editorial note points out that further improvements in design are necessary. There is one diagram and one table.

Card 1/1

ASSOCIATION: Giprostal'.

AVAILABLE:

133-8-2/28

An investigation of the wear of blast furnace hearths and the choice of design for their air cooling system. (Cont.)  
 couples should be placed on the boundary of the heat resistance concrete, no more than 4 m from the top of the hearth. The dependence of the temperature measured at a distance of 4.2 m from the top of the hearth along its axis on the wear of lining for various furnaces is shown in Fig.5. For the determination of the wear of lining on the basis of temperature at a given point in the hearth the following empirical formula is proposed:

$$x = \frac{1400 - T}{350 - 0.1 V} \quad \text{where } x = \text{thickness of the remaining}$$

lining, m;  $T$  = temperature on the axis of the hearth at a depth of 4.2 m, °C;  $V$  = volume of the furnace, m<sup>3</sup>. The comparison of calculated and determined temperatures for No.4 MMK furnace, illustrating the applicability of the above formula is given in Table 4. The wear of the above hearth on blowing out of the furnace is shown in Fig.6. A nomogram for calculating the wear of lining in hearth from indications of thermocouples for the above furnace is shown in Fig.7. On the basis of the results obtained it is concluded that air cooling of the hearth will decrease the

Card 3/4

*Andon'yev, S.M.*

AUTHORS: Andon'yev, S.M., Candidate of Technical Sciences, 130-12-4/24  
Kudinov, G.A., and Liderman, S.M., Engineers.

TITLE: Plate Coolers in the Blast Furnace Stack (Plitovyye kholod-  
il'niki v shakhte domennykh pechey)

PERIODICAL: Metallurg, 1957, No.12, pp. 8 - 9 (USSR).

ABSTRACT: The authors consider the heat-loss and cooling problems involved in using peripheral plate coolers (horizontally-ribbed vertical plates) in the blast-furnace stack, as at the Dzerzhinsk Works. This practice was described by G.G. Oreshkin and the authors examine some of his conclusions. They disagree with Oreshkin's views on optimal stack lines and point out that the ineffectiveness of utilisation of the increased furnace volume obtained with the plate coolers is shown by the equal performance of a new furnace with conventional stack cooling and with the same original volume. The authors give graphs relating the temperature of the cooler ribs to heat flow for the two Dzerzhinsk furnaces with peripheral plate coolers. There are 2 figures.

ASSOCIATION: Giprostal'

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Working Principles and Application (Cont.) 734

installing the equipment. In addition, the author gives engineering and economic data on open-hearth furnaces operating with the new system of evaporative cooling, as well as data on the effectiveness of the system. It is stated that at present more than 100 Soviet open-hearth furnaces are equipped with the new system. In this second edition certain sections have been rewritten on the basis of experience gained in the operation of the cooling systems. As in the case of the first edition, most of the book is based on studies made at the Evaporative Cooling Section of "Giprostal" (State Institute for the Planning of Steel-Industry Establishments). There are 27 references, of which 22 are Soviet, 3 German, and 2 English. No personalities are mentioned.

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GO/ksv  
11-25-58

Card 8/8

ANDON'YEV, S. M.

133-58-3-27/29

AUTHOR: Andon'yev, S.M., Candidate of Technical Sciences

TITLE: An Experience in Designing and Operating Evaporation Cooling of Metallurgical Furnaces (Opyt proyektirovaniya i ekspluatatsii isparitel'nogo okhlazhdeniya metallurgicheskikh pechey)

PERIODICAL: Stal', 1958, Nr 3, pp 271 - 280 (USSR)

ABSTRACT: A brief review of the design features of evaporation cooling as applied to open-hearth and reheating furnaces as well as of the proposed design of evaporation cooling of blast furnaces is given. At present, 120 open-hearth furnaces are operating with evaporation cooling and by 1960 the majority of open-hearth furnaces will be transferred to this method of cooling. Main technico-economical indices of the systems of water and evaporation cooling of metallurgical furnaces are given in Table 1; multiples of circulation for various parts of metallurgical furnaces (checked by experiments on an industrial scale) - Table 2; thermal intensities of cooled elements in various zones of a blast furnace - Table 3; thermal intensities on the surface of cooled parts of open-hearth furnaces - Table 4. There are 5 tables and

Card1/1 7 figures.

ASSOCIATION: Giprostal'

AVAILABLE: Library of Congress



ANDON'YEV, S.M., kand.tekhn.nauk

Evaporation cooling of blast furnaces. Biul. TSHIICHM no.7:1-7  
'58.

(MIRA 11:6)

(Blast furnaces---Cooling

Sov/133/58-9-2/29

AUTHORS: Andon'yev, S. M. (Cand. Tech. Sciences), Kudinov, G. A.  
(Engineer), Filip'yev, O. V. (Engineer)

TITLE: Some New Designs of Cooling Systems for Blast Furnaces  
(Novyye konstruktzii dlya okhlazhdeniya domennoy pechi)

PERIODICAL: Stal', 1958, Nr 9, pp 776-780 (USSR)

ABSTRACT: On the basis of a large experimental and design work (not specified) carried out by Giprostal', some new designs of cooling systems for blast furnaces are outlined. The designs were prepared for a typical furnace of 1033 m<sup>3</sup> working volume. Characteristic features: Cooling of the blast furnace stack is proposed in two modifications: 1) cooling with continuous vertical plate coolers with ring supports in each row (for supporting lining). A thin stack lining with a proportional widening of the bottom part of the furnace and the throat is recommended. This can increase the working volume of the furnace by 25-30%. Coolers are joined into vertical sections (four tubes are cast in each plate cooler - Fig.2A); 2) cooling with vertical plate coolers (Fig.2B) with supporting rings in order to give a firm support to the lining (Fig.3). The coolers are placed in a check pattern, 24 in a row, and together with supporting rings

Card 1/3

Sov/133/58-9-2/29

Some New Designs of Cooling Systems for Blast Furnaces

divide the lining into independent sectors. Supporting rings are placed at an angle of 5-10° to the horizontal plane, so that the descending burden will prevent falling out of the individual bricks and partially fill up burned out sections of brickwork (self-lining furnace). The bosh is cooled with plate coolers with ribs (Fig.4) forming cells which on erosion of the lining can be filled with the slagged burden materials. A special L-shaped cooler is proposed for the protection of the lintel (Fig.5). Coolers are joined in vertical sections. Tuyere cooling: the cooling space is divided by a plate into two longitudinal sections, communicating at the tuyere nozzle. Screw-like ribs are welded to the dividing plate (Fig.6). In this way the speed of water current can be increased to 1.5-2.0 m/sec as against 0.05-0.10 m/sec in the tuyeres used at present. Hearth: Some modifications in the construction of the hearth bottom are outlined (Figs.7, 8). Air cooling of the bottom of the hearth is recommended. The overall cooling

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Sov/133/58-9-2/29

Some New Designs of Cooling Systems for Blast Furnaces

of the furnace is shown in Fig.1: A - with a thick stack lining, B - with a thin stack lining. There are 8 figures and no references.

ASSOCIATION: Giprostal'.

Card 3/3

18(5)

SOV/128-59-4-8/27

AUTHORS: Andon'yev, S.M., Doctor of Technical sciences,  
Filip'yev, O.V., and Radionova, Ye.A., Engineers

TITLE: Vapor-Cooling System for Cupolas

PERIODICAL: Liteynoye Proizvodstvo, 1959, Nr 4, pp 14-15 (USSR)

ABSTRACT: In the course of an intensification of the cupola melting process of cast iron, it is very important to improve the cooling of the housing, in order to raise the durability of the inner fireproof casing and to enlarge the diameter of the melting belt. Water cooling of the cupola melting belt is already introduced in the Moscow Likhachev Auto Plant, in the Rostov agricultural machine works, and in a number of other big plants. With a decrease in thickness of the inner casing, the consumption of fireproof material is reduced, although more heat is lost in the cooling water, which means a raise in coke consumption. The specific losses of heat through water cooling amount to 14,800 kcal/t, if the inner casing is missing. They only total 1,200 kcal/t, if there

Card 1/3

Vapor-Cooling System for Cupolas

SOV/128-53-4-8/27

is an inner casing. With a cupola efficiency of 30%, the additional coke consumption resulting from the cooling amounts to 7.5 kg/t. Water cooling makes it possible to increase the dimensions of the cupolas and to raise their output. This cooling system, however, is deficient in several respects: the water consumption is very considerable, which is unprofitable in the engine building plants; minerals are precipitated from the cooling water and form sediments and deposits with the result, that the housing warps and burns through. At the present time the metallurgic industry mainly uses evaporative cooling. The general idea of this method is, that the heat abstracted through the cooling water is used for its evaporation. Since the vaporization heat amounts to about 540 kcal/kg, the water consumption for the cooling is reduced to a large extent, and it is possible to use chemically purified water which does not cause an incrustation of boiler scale. A project for evaporative

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Vapor-Cooling System for Cupolas

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cooling of a group of four cupolas is just being put into practice. Current can be saved with evaporative cooling because the pumping of the cooling water becomes unnecessary. There are 3 tables and 2 diagrams.

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SOV/133-59-6-12/41  
AUTHORS: ~~Andoniyev, A.M.~~, Doctor of Technical Sciences,  
Filip'yev, O.V., Engineer and Popova, Ye.V., Engineer

TITLE: An Investigation of Ports of Open Hearth Furnaces  
Fired with Gas with a Supply of Compressed Air and  
Oxygen (Issledovaniye golovok gazovykh martenovskikh  
pechey s podachey kompressornogo vozdukha i kisloroda)

PERIODICAL: Stal', 1959, Nr 6, pp 509-512 (USSR)

ABSTRACT: In view of the increasing importance of choosing the  
most suitable designs of ports for large open hearth  
furnaces, Giprostal' carried out laboratory  
investigations of a number of ports on models of  
typical 220 and 500 ton open hearth furnaces (scale 1:20)  
during which the following factors were determined:  
a) the direction of streams in the working space and  
hydraulic resistance in the port of the furnace during  
the passage of gas and fumes; b) zone of mixing fuel  
with air. The experimental procedure is outlined.  
The designs of ports tested for 220 ton and 500 ton  
furnaces are shown in Fig 1 and 2 respectively and the  
results obtained in tables 1 and 2 respectively. It was

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An Investigation of Ports of Open Hearth Furnaces Fired with Gas  
with a Supply of Compressed Air and Oxygen

SOV/133-59-6-12/41

found that: 1) Using water models and hydrochemical oscillographic methods of investigation it is possible to establish the hydrodynamic characteristics of the flame and the quality of mixing of fuel and air as well as to determine the influence of: the coefficient of excess air; additions of compressed air; oxygen; changes in the shape of the port and working space. This facilitates the choice of rational designs for industrial testing. 2) The laboratory investigations indicated that the designs of ports used in open hearth furnaces can be improved by enlarging the outlet (up to 50%) and supplying, in the top part, compressed air and oxygen in the bottom part; whereupon the resistance of the port decreases by a factor of 5. This permits: an improvement in the heating of gas checkers; an increase in the intensity of the flame volume up to 50%. It will be advantageous to decrease the length of the port by 30% which will allow

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An Investigation of Ports of Open Hearth Furnaces Fired with Gas  
with a Supply of Compressed Air and Oxygen

SOV/133-59-6-12/41

increasing the surface area of the bath.

- 3) It is advantageous to make the port lining of a thickness of 150 mm with a thermal insulation of 20 - 30 mm and metallic shell of the port of a size not exceeding 150 mm. In this way at the beginning of operation the lining will protrude 20 - 30 mm. When using metallic shell 230 - 260 mm at a high thickness of the lining the heat efficiency decreases by a factor of two after 80 - 100 heats (Fig 3). The following is recommended for industrial testing:
- a) port of a normal length with increased by 50% cross-section area of the outlet and with a supply of additional compressed air through nozzles situated in the metallic shell of the outlet. It would be advantageous to supply oxygen also (compressed air through top nozzles, oxygen through bottom nozzles);
  - b) a shortened port with the length of the bottom of 2000 mm with a corresponding increase in the length of the bath and a decrease in its depth (by 80 - 100 mm).

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SOV/133-59-6-12/41

An Investigation of Ports of Open Hearth Furnaces Fired with Gas  
with a Supply of Compressed Air and Oxygen

Using designed parameters of the port of a typical 500 ton furnace one cannot expect complete combustion of fuel in the working space, therefore, the designed thermal performance cannot be achieved without using means of flame turbulisation (compressed air or oxygen). There are 3 figures, 2 tables and 10 Soviet references.

Card 4/4

ANDON'YEV, S.M.; ZHLOBINSKIY, Ye.I.; YUR'YEV, M.A.; STRUGATSKIY, L.P.;  
YELISEYEV, B.V.; TSELUYKO; Yu.I.; SUVOROV, A.I.; FILIP'YEV, O.V.;  
KALASHNIKOV, P.A.; L'VOV, V.N.; SULOYEV, V.A.

Evaporation cooling of rolling-mill heating furnaces in open-hearth-  
furnace plants and complex utilization of secondary power resources.  
Prom. energ. 14 no.1:37-39 Ja '59. (MIRA 12:1)  
(Furnaces, Heating) (Boilers)

18.3200

77445  
SOV/133-60-1-6/30

AUTHORS: Andon'yev, S. M. (Doctor of Technical Sciences),  
Kudinov, G. A., Filip'yev, O. V. (Engineers)

TITLE: Study of Performance of Blast Furnaces With Stack  
Coolers of Various Designs

PERIODICAL: Stal', 1960, Nr 1, pp 23-28 (USSR)

ABSTRACT: A report concerning the 1958 investigation by the State  
Institute for the Design and Planning of Steel Industry  
(GIPROSTAL'), with participation of plant personnel of  
three metallurgical plants (not identified): I (furnaces  
IA-ID), II (furnaces IIA and IIB), and III (furnace IIIA)  
of following volume (m<sup>3</sup>): furnace IA-943; IB-1386;  
IV-1386; IG-1386; ID-1386; IIA-1033; IIB-1033; IIIA-1386.  
The methods of cooling the stacks of these furnaces is  
shown in Fig. 1. The design features of the furnaces;  
measuring the heat losses by the stack with water cooling;  
the effect of coolers on the temperature of gas flow;  
the analysis of furnace performance with coolers of vari-  
ous designs; the selection of cooler's design and the

Card 1/8

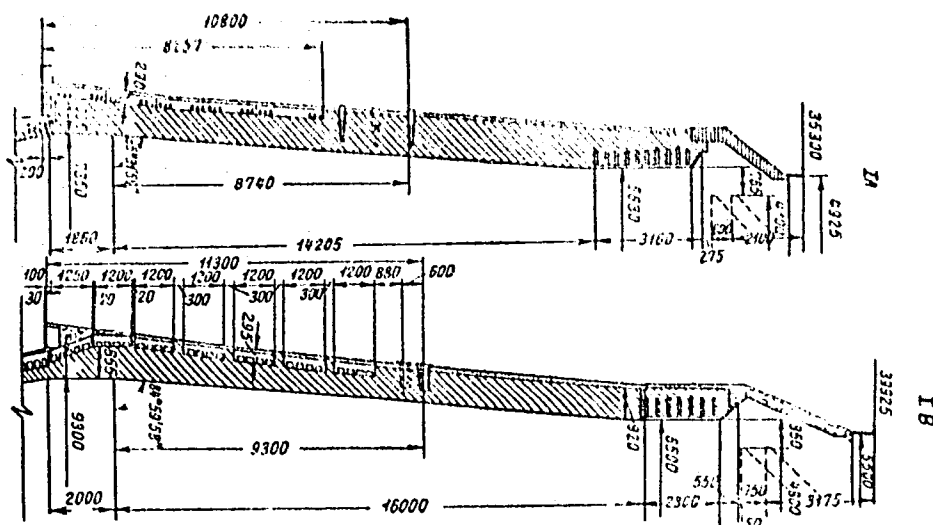
Study of Performance of Blast Furnaces With  
Stack Coolers of Various Designs

77045  
SOV/133-60-1-6/30

thickness of stack lining are discussed. A recommended optimum design of a typical blast furnace is given in Fig. 4. The authors arrived at the following conclusions: (1) The vertical peripheral coolers of stack, installed as continuous belts tight against blast furnace shell, are recognized to be the best. Though the stack heat losses with these coolers (with maximum burning out of the lining) in the average are 20% higher than that in the case of horizontal or "bracket type" coolers, the analysis of furnace performance showed no negative effect of plate type coolers on coke consumption and furnace output. (2) The peripheral plate type coolers are reliable and protect the blast furnace shell from heating, which eliminates the necessity of external spraying (in the case of continuous belts, set tight against the furnace shell, without gaps). Their life is 4 to 5 times higher than that of horizontal or "bracket type" coolers. (3) The thickness of stack lining, when plate type coolers are installed, should be reduced to 575 mm. (4) In the event the coolers are equipped with

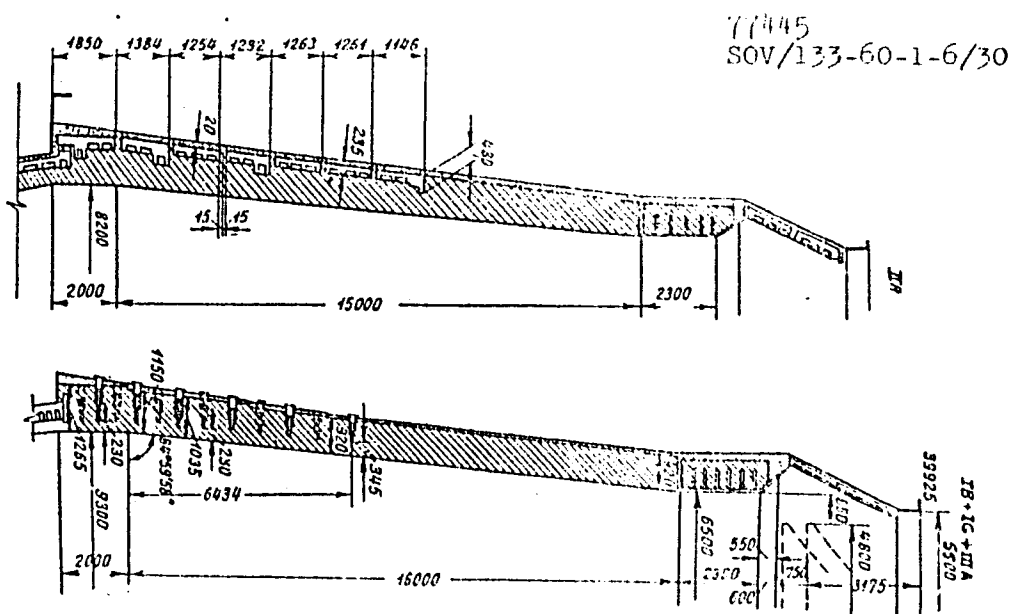
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SOV/133-60-1-6/30



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Fig. 1 (cont'd)



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Fig. 1 (cont'd)



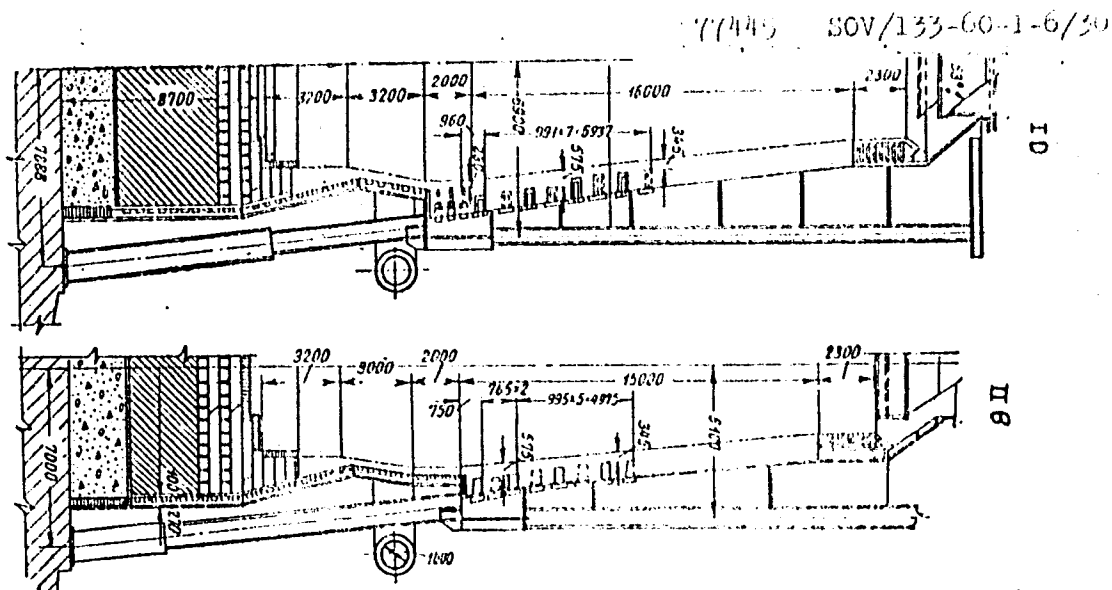
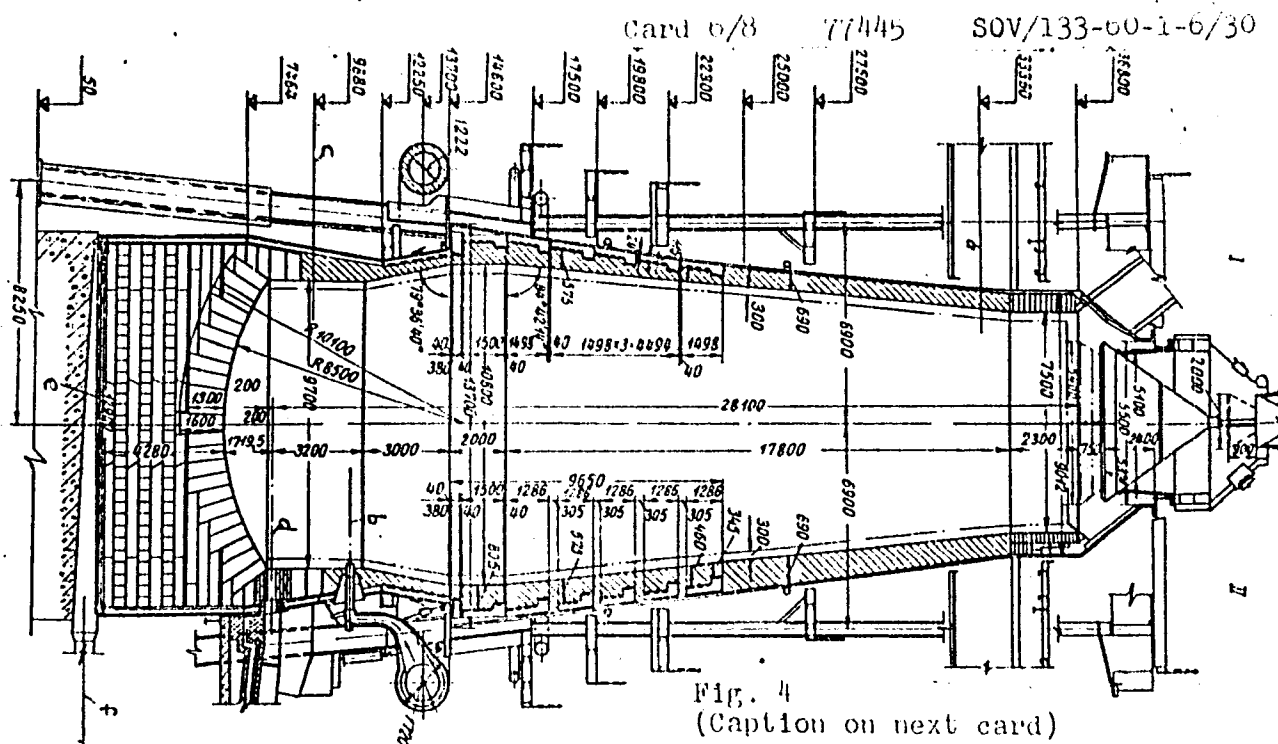


Fig. 1. The cooling systems used in stacks of investigated blast furnaces.

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Study of Performance of Blast Furnaces With  
Stack Coolers of Various Designs

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Caption to Fig. 4.

Fig. 4. Recommended design for the increase of working volume of a typical blast furnace from 1719 to 1960 m<sup>3</sup>.  
(I) an alternate design showing an installation of plate type coolers (continuous belts); (II) an alternate design showing an installation of coolers with gaps along the height; (a) axis of pipe for taking gas samples; (b) axis of air tuyere; (c) axis of slag notch; (d) axis of iron notch; (e) metal stock; (f) ventilating blast.

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Study of Performance of Blast Furnaces With  
Stack Coolers of Various Designs

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supporting shelves, the life of lining should increase.  
(5) Due to the fact that plate type coolers work under difficult conditions of slag hardened on the walls of blast furnace, it is recommended to cast them from the alloyed, growth resistant cast iron of ZhChKh -2,5 type. Following dimensions of plate type coolers are recommended: thickness of ribbed portion of cooler--115 to 150 mm; thickness of the main metal part of cooler--120 mm. The poured-in fire clay should not occupy more than 55% of cooler's surface. For cooling of the bosh the ribbed coolers without poured fire clay are recommended. The height of the rib should be about 75 mm. The ribs of the plate type coolers should have the longitudinal and transverse slots for the relief of thermal stresses. There are 4 figures; and 5 tables.

Card 8/8

ANDON'YEV, S.M.; FILIPP'YEV, O.V.; ZHITOMIRSKIY, I.S.

New method for simulating the mixing of fuel, air, and oxygen  
in open-hearth furnaces. Inzh.-fiz.shur. no.1:25-29 Ja '60.  
(MIRA 13:4)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut  
metallurgicheskoy promyshlennosti, "Giprostal," Khar'kov.  
(Open-hearth furnaces)

a.

S/137/61/000/010/003/056  
A006/A101

AUTHORS: Andon'vay, S. M., Somonenko, M. S.

TITLE: Experiences of use and economic efficiency of evaporation cooling of metallurgical furnaces at USSR plants

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 10, 1961, 9 - 10, abstract 10B55. ("Sb. nauchn. tr. Gos. n.-i. proyekt. in-t metallurg. prom-sti "Giprostal'", 1960, no. 2, 152 - 160)

TEXT: The authors analyzed the operation of evaporation cooling devices on metallurgical furnaces at USSR plants. It was established that the use of vapor saved alone > 870,000 tons reference fuel during 1959. The financial savings in 1959 for operational expenses and from using vapor at the plants amounted to about 110 million rubles. Nevertheless, the assimilation of evaporation cooling proceeds still very slowly. The existing evaporation cooling devices at the plants are used very little. At some plants useful parts are exchanged, as their burning during the next campaign is feared. It is necessary to intensify the technical control by 'Giprostal' and the control for the observation of operational rules and technical specifications in manufacturing the parts to be cooled. On evaporation

Card 1/2

Experiences of use and economic efficiency of...

S/137/61/000/010/003/056  
A006/A101

cooling units with up to 3 atm vapor pressure; the separator drums must be elevated to 12 - 15 m height; the parts to be cooled must be connected to them to improve their stability. To eliminate the possibility of scale formation and slag accumulation the water conditions of the system must be daily checked. The chemical composition of the boiler water is: hardness not over 1 mgequiv/l; alkalinity not over 30 mgequiv/l; salt content 15,000 - 20,000 mg/l. Vapor pressure should not be below 6 - 8 atm to assure the full utilization of the steam. ✓

B. Mastryukov

[Abstracter's note: Complete translation]

Card 2/2

ANDON'YEV, S.M., doktor tekhn.nauk

Evaporative cooling of metallurgical furnaces. Trudy ITO chern.  
met. 20:236-252 '60. (MIRA 13:10)

1. Girpostal'.  
(Metallurgical furnaces—Cooling)



ANDON'YEV, Sergey Mikhaylovich, doktor tekhn. nauk. Prinsipali uchastiy:

BELAN, F.I., inzh.; MALAMUD, Ye.A.; TSELUYKO, Yu.I., inzh.; KER-  
ZHNER, S.M., inzh.; SIRENKO, B.M., inzh.; FILIP'YEV, O.V., inzh.;  
KOCHO, V.S., doktor tekhn. nauk, prof., retsenzent; NITSKEVICH, Ye.A.,  
red.; YEZDOKOVA, M.L., red. izd-va; DOBUZHINSKAYA, L.V., tekhn. red.

[Evaporation cooling of metallurgical furnaces] Isparitel'noe okh-  
lazhdenie metallurgicheskikh pechei; osnovnye polozenia. Moskva,  
Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii,  
1961. 447 p. (MIRA 14:10)

(Metallurgical furnaces--Cooling)

ANDON'YEV, S.M.; FILIP'YEV, O.V.; KUDINOV, G.A.

Increasing the durability of blast furnace hearth bottoms.  
Metallurg 8 no.7:9-11 J1 '63. (MIRA 16:8)

1. Gosudarstvennyy institut po proyektirovaniyu predpriyatiy po  
proizvodstvu stali.  
(Blast furnaces—Design and construction)

ANDON'YEV, S.M., doktor tekhn.nauk; TSELYUKO, Yu.M., inzh.;  
KATSENELENOGEN, L.B., inzh.; MOSTITSKIY, A.V., inzh.;  
RUDNITSKIY, Ya.N., inzh.; PEVKO, A.P., inzh.; TRUSH, V.I., inzh.

Investigating thermal processes in converter "caissons" and  
chimneys. Stal' 22 no.2:173-176 F '62. (MIRA 15:2)

1. Gosudarstvennyy institut po proyektirovaniyu metallurgicheskikh zavodov i predpriyatiy.  
(Bessemer process)  
(Heat—Transmission)

ANDON'YEV, S.M., doktor tekhn. nauk; TSELUYKO, Yu.I., inzh.; RUDNITSKIY,  
Ya.N., inzh.; KOTEN, M.G., inzh.

Lead-off of converter gases without burning them in the combustion  
chamber. Prom. energ. 18 no.6:17-21 Je '63. (MIRA 16:7)

(Steel--Metallurgy)

ANDON'YEV, S.M., doktor tekhn.nauk; TSELYUKO, Yu.I., inzh.; RUDNITSKIY, Ya.N.,  
inzh.; KATSENELENOGEN, L.B., inzh.; FAYERSHTEYN, A.D., inzh.;  
KI KURUZNYAK, I.S., inzh.

Investigating experimental contours with natural circulation of water  
in the chimney of an oxygen-blown converter. Stal' 23 no.7:664-667  
Jl '63. (MIRA 16:9)

1. Gosudarstvennyy institut po proyektirovaniyu prodpriyatiy po  
proizvodstvu stali i Krivorozhskiy metallurgicheskiy zavod.  
(Converters--Cooling)

ANDON'YEV, S.M.

14 S. 11A

1:1595-65 EWT(d)/EWT(m)/EWP(c)/EWA(d)/EWP(v)/T-2/EWP(t)/EWP(k)/EWP(b)/EWP(1)  
ACCESSION NR AM4046730 BOOK EXPLOITATION Pf-4 MJW/JD/ S/  
MLK

Samarin, A. M., ed. (Corresponding member, Academy of Sciences, U.S.S.R.) B+/

Steel production; handbook (Staleplavil'noye proizvodstvo; spravochnik),  
t. 2., Moscow, Izd-vo "Metallurgiya", 1964, 1039 p. illus., biblio.,  
tabul. Errata slip inserted. 5,850 copies printed.

TOPIC TAGS: steel, open-hearth furnace, quality control, refractory

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ACCESSION NR AM4046730

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L 17595-65

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ANDON'YEV, S.M., doktor tekhn.nauk; FILIP'YEV, O.V., kand.tekhn.nauk;  
KUTSYKOVICH, D.B.; GOL'DIN, Sh.L., inzh.

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